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Weekly Bulletin

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Airplanes Used To Control Mosquitoes.

We are more or less familiar with the use of the airplane in the distribution of insecticides for the control of the boll weevil and other agricultural pests, and now the United States Department of Agriculture Bureau of Entomology announces the results of experimental work in airplane dusting (Paris green) in the control of malaria mosquitoes. It would appear that this method of control may be advantageous in large, swampy, inaccessible areas, where temporary control measures are made necessary. The report of the experiments follows:

"For the past three years experiments have been conducted by the United States Bureau of Entomology at Mound, Louisiana, on the use of airplanes in distributing larvicides over the breeding places of malaria-carrying mosquitoes. This work has been carried out with the cooperation of the Delta Laboratory of the Bureau at Tallulah, Louisiana, and the Air Service of the United States Army. The planes used had been equipped for cotton dusting and were provided with metal dust hoppers installed in the rear cockpit, with an opening through the bottom of the fuselage for the release of the dust. The hoppers were designed to hold a load of 300 pounds of material and the rate of delivery could be varied by means of a sliding valve adjustment.

The possibility of using planes for this purpose was suggested when it was found that Paris green applied as a dust was highly effective in destroying the larvæ of this particular kind of mosquito. These larvæ have the habit of feeding at the surface of the water and skim their food from the surface film. Paris green although heavier than water will float, due to the surface tension, long enough to be taken up by the larvæ along with their food. Since only a minute quantity is required to kill each larva it is not necessary to actually poison the water and for this reason fish are not injured and there is little or no danger from the drinking of treated water by domestic animals. Unfortunately, other species of mosquitoes which feed below the surface film are not affected either but in most of the malarious regions the other mosquito pests which are troublesome about the houses are not produced in the large swamp areas. Their breeding places are the water barrels and cisterns, ditches and small pools near the dwellings which would not be subject to airplane treatment.

Because of the small quantity of Paris green required, an inert dust of some sort is used as a diluent and carrier. This is found to be quite necessary to secure thorough distribution without using an excessive amount of the poison. A variety of substances have been employed by ourselves and others, including ordinary road dust, sand, cork dust, calcium carbonate, diatomaceous earth, a mixture of lime and flour and an amorphous siliceous dust known as Tripoli earth. These materials differ considerably in density and fineness of grain which affect distribution and especially the distance of drift. In most of our experiments we have used the Tripoli earth because of its availability and uniformity. It also

Defective

had an advantage over the lighter materials in treating breeding places protected by trees since its heavier weight caused it to settle more quickly.

The mixtures used for airplane distribution contained from five to twenty per cent Paris green—ten per cent being the usual proportion. Under average conditions a half pound of Paris green per acre, or five pounds of the ten per cent mixture was taken as the basis for estimating the amount of dust to be used. This gave a leeway for a certain amount of wastage resulting from wind drift and adherence of the dust to the leaves of aquatic vegetation. Where the breeding places were protected by a heavy growth of brush and trees the amount of dust had to be considerably increased. On the other hand where there was little vegetation above the water surface a much smaller quantity was required. The amount put out on a given area could be regulated by the opening of the hopper valve and by the distance between successive trips of the plane. Some substances fed out two or three times as fast as others and this had to be taken into consideration in making the valve adjustments.

In effectively treating swamp areas careful attention had to be given to the drift of the dust cloud. In the early experiments the dusting was tried in the early morning when the air is usually still but the presence of dew on the leaves at this time of day proved to be a serious drawback since it caught the dust particles and prevented their reaching the water surface. By the time the leaves become dry there is almost always more or less wind but it was found that, with proper handling of the planes, a slight breeze was often of advantage in helping to distribute the dust. Occasionally, however, the wind at this time of day would be too strong for successful dusting and the operation would have to be postponed.

The shallow swamp lakes in this region consist usually of a central treeless area containing a growth of water lilies and a variety of smaller aquatic vegetation favorable for mosquito breeding. Around the margins the water spreads out during a part of the season into a thick stand of brush and tall willow trees. With a skillful pilot no especial difficulty was encountered in successfully treating the central portion even when the lily growth was so thick as to almost obscure the water surface. The treatment of areas protected by brush and trees was a much more difficult proposition and the results under these conditions were quite variable. When such breeding zones were comparatively narrow the application could be made by flying the planes on the windward side of the tree line and allowing the dust to drift in from the side. Where the area was larger it was necessary to fly directly over the tree tops but even in such places the dust was found to penetrate the thick growth provided a sufficient quantity was used to offset the greatly increased wastage.

In work of this kind the greatest item of expense is, of course, the operation of the airplanes, but only approximate figures as to cost can be given at the present time. This matter has been discussed at length with representatives of the Huff, Daland Aero Corporation who undertook commercial cotton dusting against the boll weevil during the past season. The estimates arrived at have varied from fifty cents to about one dollar per acre, including the cost of poison. With a unit organized solely for lake dusting a large acreage would have to be included to make the proposition feasible and the cost would probably approximate the higher figure. However, if the work is carried out in conjunction with a cotton dusting unit it is believed that the actual cost would be from fifty to sixty cents per acre on the average. This would provide an economical method of distribution were it necessary to make only a few applications. Unfortunately, Paris green remains effective on the water for only a very short time and where mosquito breeding is continuous it is necessary to reapply it every eight or nine days to prevent the emergence of adults. Consequently, the cost runs up rapidly over a period of several months.

As compared to any method of hand distribution, however, it is believed that, even under present conditions, the cost would be much in favor of airplanes on an area large enough to justify their use. Moreover, there are many swamp breeding places which it would be almost impossible to treat either from the ground or from boats.

During 1922, an experiment on the control of Anopheles breeding areas by means of the hand distribution of diluted Paris green was undertaken by the Public Health Service in the vicinity of Lake City, Florida. Figures published by Mr. T. B. Hayne, in charge of the work, showed that the cost of twelve applications to an area of approximately 475,000 square feet was $773 for labor and poison—a rate of about $5.90 per acre per application. Mr. Hayne estimated that, from the experience gained, the work could be repeated at a reduction of 20 to 30 per cent in cost and this would possibly represent the expense of such work under average conditions.

The use of temporary methods of malaria control such as poisoning and oiling are not, of course, employed except where drainage or other permanent measures can not be undertaken at the time. The expense which would be justified in a control campaign in any community depends upon the size of the population effected and the severity of malaria infection. Even with these limitations, it is believed that a certain number of malarious locations are to be found where the distribution of Paris green by means of airplanes could be economically employed and the opportunities would be materially increased by any reduction in the cost of airplane operation or by some improvement in the larvicide so that the number of applications required would be reduced."

* * *

Now Is Time To Prepare For School.

Mothers, whose children are given physical examinations before they enter school, are enthusiastic over the benefits that come to their children as a result of these examinations. A skilled physician is able to discover minor physical defects that the mother has no inkling of. In themselves, these defects may not be important at the present time, but within a short period they may develop into serious physical handicaps, hindering the school progress of the child. Decayed teeth, enlarged tonsils and adenoids, faulty nutrition or posture and defective eyes or ears are the most common defects encountered. Frequently, however, the examinations reveal the beginning of a serious condition, such as heart trouble or tuberculosis. Many children's lives have been saved through the early recognition of such a condition and the prompt institution of remedial measures.

The Bureau of Child Hygiene of the California State Board of Health is sponsoring the examination of children of preschool age. Conferences where such examinations are made, free of charge, are being held in nearly every county of California. The services of skilled medical men, assisted by competent public health nurses, are available at these conferences. Parents who desire to take advantage of this opportunity to learn the exact status of the health of their young children will profit greatly. Now is a good time to have a child examined, as it permits an interval of several months before school opens, during which period the child may be made physically fit for the first grade.

Poliomyelitis Bears Careful Watching Now.

Attention is called to the fact that cases of acute anterior poliomyelitis have been reported with a considerable degree of consistency during the winter and early spring months. The same consistency in reporting was noticed during the winter and spring of 1924-1925, preceding the widespread and sharp outbreak of the disease that occurred in California last summer and fall. These facts, in themselves, do not constitute a sure indication that there will follow any unusual incidence of poliomyelitis during the coming summer and fall. The circumstances are such, however, that it makes necessary a continual alertness in the discovery and placing under control of any and all cases that may be suspicious of poliomyelitis. The best procedure known in the prevention of this disastrous disease lies in the finding of early cases and placing them in isolation immediately, making certain that there is absolutely no opportunity for contact with other persons. The maintenance of strict isolation is of the greatest importance.

The following table gives full information concerning the incidence of poliomyelitis in California during the past two years. Attention is called to the numbers of cases reported during the winter months of each year.

POLIOMYELITIS.

May 5, 1926.

Months	1924	1925	1926 (to date)
January	8	16	8
February	4	12	15
March	9	11	13
April	4	29	5
May	1	31	--
June	4	76	--
July	10	201	--
August	9	198	--
September	17	104	--
October	51	49	--
November	39	51	--
December	36	23	--
Totals	192	801	41

* * *

If I were to offer a prayer, it would be first for the spiritual excellence of our nation and next for its well-being in health. In order to effect the physically perfect nation, I would begin with the children.—Warren Harding.

* * *

One remarkable feature of the "guardianship of infants act," which has just become effective in Great Britian, is that the mother of an illegitimate child now acquires a legal status, as her consent must be obtained for the marriage of the child.

MORBIDITY.*

Diphtheria.

88 cases of diphtheria have been reported, as follows: Alameda 1, Berkeley 1, Oakland 9, Fowler 1, Colusa County 1, Los Angeles County 9, Long Beach 1, Los Angeles 37, Lynwood 1, Hawthorne 1, Orange County 1, Sacramento 3, San Diego 9, San Francisco 10, Stockton 1, Santa Clara County 1, San Jose 1.

Measles.

370 cases of measles have been reported, as follows: Berkeley 4, Oakland 107, Piedmont 15, Butte County 1, Fresno County 8, Fresno 2, Los Angeles County 22, Long Beach 1, Los Angeles 14, San Gabriel 4, Torrance 1, Maywood 4, Madera County 1, Napa 1, Riverside 2, Sacramento County 1, San Diego 1, San Francisco 174, Lodi 1, Stockton 1, Turlock 1, Sonora 1, Santa Paula 1, Ventura 2.

Scarlet Fever.

116 cases of scarlet fever have been reported, as follows: Alameda 2, Berkeley 7, Livermore 1, Oakland 4, Butte County 9, Chico 1, Colusa 1, Fresno County 3, Fresno 2, Eureka 1, Kern County 2, Bakersfield 1, Kings County 3, Los Angeles County 1, Hermosa Beach 1, Long Beach 7, Los Angeles 20, Redondo Beach 1, Santa Monica 3, Riverside 2, Sacramento 2, Ontario 1, San Diego 3, San Francisco 14, Stockton 5, San Luis Obispo 6, Burlingame 1, Santa Clara County 5, San Jose 1, Solano County 2, Red Bluff 1, Ventura 3.

Smallpox.

61 cases of smallpox have been reported, as follows: Oakland 10, San Leandro 1, Chico 4, Los Angeles County 1, Los Angeles 19, Merced County 1, Roseville 7, Sacramento 1, San Diego 1, San Francisco 5, San Joaquin County 6, Stockton 1, San Jose 1, Sonoma County 2, Yuba City 1.

Typhoid Fever.

15 cases of typhoid fever have been reported, as follows: Berkeley 3, Imperial County 1, Kern County 1, Los Angeles 2, Sacramento County 2, Sacramento 1, San Francisco 4, California 1.

Whooping Cough.

62 cases of whooping cough have been reported, as follows: Oakland 8, Chico 1, Calexico 2, Kern County 1, Kings County 1, Los Angeles County 3, Long Beach 6, Los Angeles 5, Colton 1, San Diego 5, Stockton 1, San Luis Obispo County 6, San Luis Obispo 1, Santa Barbara County 8, Tehama County 10, Santa Paula 3.

Epidemic Meningitis.

2 cases of epidemic meningitis have been reported as follows: Long Beach 1, Sacramento 1.

Poliomyelitis.

3 cases of poliomyelitis have been reported, as follows: Alhambra 2, Los Angeles 1.

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*Reports received on May 3d and 4th, for week ending May 1st.

COMMUNICABLE DISEASE REPORTS.

Disease	1926				1925			
	Week ending			Reports for week ending May 1 received by May 4	Week ending			Reports for week ending May 2 received by May 5
	Apr. 10	Apr. 17	Apr. 24		Apr. 11	Apr. 18	Apr. 25	
Anthrax	0	0	0	0	0	0	0	0
Chickenpox	283	312	290	264	254	301	325	220
Diphtheria	99	85	100	88	112	90	109	115
Dysentery (Bacillary)	1	0	2	2	3	1	3	0
Epidemic Encephalitis	0	3	1	0	2	3	3	3
Epidemic Jaundice	0	0	0	0	0	1	0	0
Epidemic Meningitis	2	8	2	2	2	3	2	0
Gonococcus Infection	95	74	83	105	95	109	113	60
Influenza	30	60	17	15	45	61	35	61
Leprosy	1	0	0	0	1	1	0	1
Malaria	1	2	0	0	0	1	0	1
Measles	195	231	218	370	106	105	120	85
Mumps	234	358	318	322	229	330	472	385
Paratyphoid Fever	0	1	1	0	0	0	0	0
Pneumonia (lobar)	56	49	38	30	114	76	42	38
Poliomyelitis	2	2	1	3	3	1	12	12
Rabies (animal)	11	7	10	8	12	4	13	0
Scarlet Fever	101	133	115	116	118	114	129	109
Smallpox	82	87	103	61	121	161	189	169
Syphilis	181	123	85	110	172	131	102	178
Tetanus	0	2	1	0	1	1	0	0
Trachoma	1	5	2	2	0	6	7	0
Tuberculosis	217	259	156	150	261	282	169	202
Typhoid Fever	12	77	16	15	8	15	12	11
Typhus Fever	1	0	0	0	0	0	0	0
Whooping Cough	83	50	76	62	358	486	450	420
Totals	1688	1928	1735	1725	2017	2283	2307	2070

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